DOCUMENT RESUME

ED 246 976 JC 840 449

AUTHOR	Atwell, Charles A.; Sullins, W. Robert
TITLE	Curricular Comprehensiveness in Small Rural Community Colleges. "Horizons Issues" Monograph Series.
INSTITUTION	American Association of Community and Junior Colleges, Washington, D.C. Council of Universities and Colleges.; ERIC Clearinghouse for Junior Colleges, Los Angeles, Calif.
SPONS AGENCY	National Inst. of Education (ED), Washington, DC.
PUB DATE	84
CONTRACT	400-78-0038
NOTE	78p.
AVAILABLE FROM	American Association of Community and Junior Colleges, One Dupont Circle, N.W., Washington, DC 20036 ($5.00).
PUB TYPE	Information Analyses - ERIC Information Analysis Products (071) -- Reports - Research/Technical (143)
EDRS PRICE	MF01/PC04 Plus Postage.
DESCRIPTORS	*College Curriculum; *Community Colleges; Curriculum Research; Educational Finance; *Financial Support; National Surveys; Rural Education; *Rural Schools; School Size; *Small Colleges; Transfer Programs; Two Year Colleges; Vocational Education

ABSTRACT

A nationwide study was conducted to assess the degree of curricular comprehensiveness in small rural community colleges and to identify funding mechanisms and strategies that affect comprehensiveness. Data were collected on transfer and occupational-technical offerings from 160 public two-year colleges that enrolled fewer than 2,500 headcount students, identified themselves as rural, and offered associate degrees in both transfer and occupational programs. An index of comprehensiveness was constructed to measure both the breadth and depth of curricular offerings in transfer and occupational programs. Study findings included the following: (1) with the exception of professional work in architecture, engineering, and agriculture, the majority of the small rural colleges offered a wide variety of transfer programs, courses, and course sequences; (2) larger community colleges were able to offer more diverse transfer programs than their smaller counterparts; (3) differences among institutional types in occupational-technical programs were much more pronounced, with curricular comprehensiveness increasing with size; (4) there was a wide range of program diversity among institutions of similar size and setting; (5) small rural community colleges received special considerations from funding agencies; and (6) a number of instructional practices, curricular designs, cooperative ventures, and staffing plans were identified as means of offering additional courses. Recommendations and information on calculating the transfer and occupational indices are included. (LAL)

ED246976

Curricular Comprehensiveness in Small Rural Community Colleges

By Charles A. Atwell
and
W. Robert Sullins

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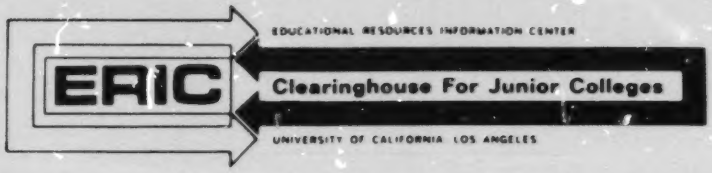
Charles A. Atwell
and
W. Robert Sullins

"Horizons Issues" Monograph Series

ERIC Clearinghouse for Junior Colleges/American Association of Community and Junior Colleges/Council of Universities and Colleges



The material in this publication was prepared pursuant to a contract with the National Institute of Education, U.S. Department of Education. Contractors undertaking such projects under government sponsorship are encouraged to express freely their judgment in professional and technical matters. Prior to publication, the manuscript was submitted to the American Association of Community and Junior Colleges, Council of Universities and Colleges for critical review and determination of professional competence. This publication has met such standards. Points of view or opinions, however, do not necessarily represent the official view or opinions of the Council of Universities and Colleges or the National Institute of Education.

This publication was prepared with funding from the National Institute of Education, U.S. Department of Education, under contract NO. 400-78-0038. The opinions expressed in this report do not necessarily reflect the positions or policies of NIE or the Department.

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PREFACE

Our interest in small rural community colleges goes back nearly two decades to a period when states throughout the southeast and the mid-Atlantic regions were establishing community colleges, mostly small and/or rural, at breakneck speed. We were privileged to work in two of those states, Alabama and Virginia, at a time when their community colleges were in their infancy. The appreciation we developed for these colleges and for the tireless individuals who led them has been reinforced over the years by our contacts with similar colleges throughout the country.

For years, small rural community colleges have formed a kind of silent majority, doing their jobs, serving their students, "making do" in many cases while attention and publicity focused on the mammoth urban institutions like Miami-Dade, Northern Virginia, Dallas, Los Angeles, and Chicago. With the establishment of the Small/Rural College Commission in 1978, small colleges discovered a forum but, more often than not, found that they were talking about themselves to themselves. If it serves no other purpose, we hope this monograph will help focus attention on this important segment of postsecondary education.

We are indebted to a number of people who helped make this monograph possible, not the least of whom are the nearly 250 respondents to a rather lengthy and detailed survey instrument. Special thanks are due to Paul Gianini, president of Spoon River Community College and immediate past-president of the Small/Rural College Commission, for his assistance and encouragement. Our colleagues at Virginia Polytechnic Institute and State University and at the numerous small rural colleges with which we have worked over the years have shaped our ideas and beliefs about these colleges; and our graduate students, many of them experienced practitioners from small rural colleges, have taught us much more than we have taught them, we are sure.

Two graduate students, in particular, warrant special mention. Bruce Downey and Louise Kaplan, whose dissertation research sprang from our interest in small rural colleges, have contributed immeasurably to this monograph. Bruce's work on economy of scale was highly informative, and Louise designed the comprehensiveness index which we used as a measure of program diversity. Nancy Vandett and Judith Scott made countless helpful editorial suggestions, and Pat Bryant and Vicki Thornhill typed and retyped the manuscript far too many times

to mention. Finally, we thank our colleagues in the Council on Universities and Colleges of the American Association of Community and Junior Colleges (AACJC) who entrusted this task to us.

Charles A. Atwell
W. Robert Sullins
Blacksburg, Virginia
October, 1983

PART 1. ACCESS, COMPREHENSIVENESS AND MISSION ATTAINMENT

INTRODUCTION

Community colleges have played a significant role in making higher education accessible to virtually every American. In particular, the two-year colleges established in sparsely populated, rural regions across the nation have created a level of accessibility otherwise unattainable. Responding to recognized needs of rural citizens, two-year colleges have been created within sparsely populated regions as readily as in urban or suburban areas; and it is likely these institutions were established with full awareness that, for the most part, they would remain small. Many of the oldest as well as the newest two-year colleges are small and are located in rural regions, indicating that policymakers have been diligent in attending to the educational needs of rural citizens.

Today, small rural colleges comprise a substantial segment of the total community college enterprise. "Small" has been defined in a variety of ways depending upon the interests and perceptions of researchers and reporters. The term "small" readily lends itself to a simple arbitrary choice of headcount or full-time equivalent student (FTEs) enrollment. A 1978 national study of small rural colleges (Nelson, 1979; Ross, 1979), utilized a definition of small colleges as those enrolling fewer than 2,500 headcount students, and we have chosen to use that figure in this study. Table 1 reflects fall 1980 enrollment data for public two-year colleges; nearly 20 percent of those institutions enrolled fewer than 1,000 students, and more than half enrolled fewer than 2,500.

Table 1

Number of Public Two-Year Colleges, by Enrollment Category, Fall, 1980

Enrollment	Number of Institutions	Percent
1–999	187	18.6
1,000–2,499	324	32.2
2,500–4,999	211	21.0
5,000–9,999	177	17.6
10,000+	107	10.6

Source: *1982 Community, Technical and Junior College Directory* (pg. 20). Washington, DC: AACJC, 1982.

"Rural" is more difficult to define since one must consider population density, economic base, income levels, and distance from a metropolitan area, among other criteria. Many community colleges report service areas that include cities surrounded by large farming areas. In 1982, when responding to the annual survey of two-year colleges conducted by the American Association of Community and Junior Colleges, 571 two-year college presidents out of more than 1,200 listed their colleges as "rural" (AACJC, 1982b). Rather than attempt yet another definition of "rural," we have chosen to use as the population the AACJC list.

Even with the lack of a precise definition, it seems clear that small rural community colleges make up a little less than one-half of all community colleges and provide access to higher education for "over one-fourth of the population of the country who are living on ninety-eight percent of the land" (Kuvlesky and Copp, 1981, p. 4).

The importance of these institutions seems indisputable; yet the leaders of many small rural community colleges claim they are inadequately funded, understaffed, often ignored or misunderstood, and unfairly treated, when compared to their counterparts in metropolitan areas. In response, the Board of Directors of the American Association of Community and Junior Colleges appointed a Task Force on Rural Community Colleges in 1976 and charged it to "focus on issues of concern to community colleges enrolling small numbers of people but serving large geographical areas" (Vineyard, 1979, p. 29). The task force set out to determine special problems faced by its constituents, to develop position papers to address those problems, and otherwise to bring to the forefront important issues that highlighted the small rural community colleges. The Association gave the task

force more permanent status as the AACJC's Small/Rural Community College Commission. Identified problems associated with these colleges included "the impoverishment of cultural, social and recreational services in the area; the lack of part-time jobs for students and positions for graduates; program comprehensiveness with a limited total enrollment; the various inefficiencies of smallness; attracting and developing staff; competition in procurement of grants and other funds; conforming with intricate federal and other regulatory requirements; financial stress; community financial crisis related to lack of diversification of the economic base; lack of time and expertise to research local problems; communications problems in a sparsely populated area; housing of students; lack of exposure and visibility in the media at the various capitals and within higher education and the community college movement; lower educational levels of parents and other adults; and a weak economic base caused by property values scattered over a wide geographic terrain." (Vineyard, 1979, p. 34)

Given the current climate for higher education in general, there is little wonder that college presidents are concerned about the future of the colleges they serve. The 1980s will be viewed as a period of reexamination for community colleges as the purpose of these colleges is seriously questioned. Cross (1981) referred to the current period as a "plateau" between a period of growth and energy and one characterized by uncertainty about the future and concern for what it holds. Richardson and Leslie (1980) questioned whether, in today's funding climate, there will be adequate public funds to support the comprehensive mission of the community college as it has evolved. Breneman and Nelson (1981) suggested that many, if not all, community colleges should narrow their focus and look for alternative sources of funding, including increased tuition, users' fees, and increased local support.

Reacting to statements of concern expressed by the AACJC Small/Rural Community College Commission, researchers at the University of Virginia and at Virginia Polytechnic Institute and State University set out to determine just how widespread these concerns were and whether they were unique to small rural colleges. That research, reported by Ross (1979) and Nelson (1979), confirmed that the concerns expressed by commission members were shared by their peers nationwide. Thirty-two specific problem areas were investigated, and 25 of them were perceived to have significantly greater impact on the small rural colleges. Eight of the problems were of major importance to more than one-third of small rural and large urban respondents but were of greater importance to the former group (Ross, 1979). The greatest variation between small rural and large urban

colleges included lack of cultural, social, and recreational services in the community; difficulty communicating with constituents; difficulty attracting competent staff; lack of personnel to write grants and develop resources; difficulty providing adequate library and media resources; difficulty providing staff development; difficulty providing comprehensive curricular offerings that are responsive to community needs; difficulty meeting accreditation standards; need for administrators to fill many roles; difficulty providing comprehensive student services; and limited institutional research capabilities (Nelson, 1979).

Research to date, although scant and generally perceptual, seems to validate the existence of problems unique to small rural community colleges. For example, college administrators are asked to "wear many hats" and to fill a variety of roles; frequently they are not able to concentrate on an area of specialization or expertise. Faculty members are asked to teach courses from more than one discipline; and the communities served by the colleges often lack a range of cultural activities or services usually provided in more urban areas by agencies or other institutions.

It seems, however, that the most pressing problems relate to finance and curriculum. High, fixed overhead and administrative costs, small classes, and expensive off-campus programming elevate per-student costs in small rural colleges to levels often questionable to policymakers. Small rural colleges often are unable to realize the efficiencies of large lecture classes, extensive use of part-time faculty, multiple sections of the same course, full use of expensive laboratories and shops, and other economies of scale taken for granted at larger institutions. Several states have recognized the financial realities of small colleges through some type of differential funding, but many have not (TenHoeve, 1981). Associated with funding problems is the difficulty of maintaining comprehensive programs and services. Colleges with small enrollments and limited funding find it extremely difficult to provide even a modest array of curricular offerings, especially in the occupational-technical areas.

Bowen reported that "institutional size and unit cost are not closely related in any rigid or mechanical fashion" and that "institutions of the same size operate at quite different unit costs and institutions of quite different size operate at the same cost" (1980, p. 197). Institutions can control costs by adjusting programs, eliminating high-cost or low-enrolled programs, and employing other efficiency measures; but in almost every case, those measures limit comprehensiveness. The question then arises: To what extent do small rural community colleges need to maintain comprehensive programs and services to make "equality of access" meaningful? Small rural

community colleges serve regions containing nearly sixty million constituents and play a major role in making access a reality. One of the goals of American society has been equality of opportunity, including educational opportunity. Ideally every student is entitled to and should have access to the same educational opportunity. If the mere size of an individual institution within a state-wide system of community colleges contributes to differences in opportunity, "then in terms of society's own minimum standards of educational opportunity, such a performance is unacceptable *per se*" (Downey, 1983, p. 5). "To permit the size of an institution to dictate which students, in which communities, will have the opportunity to become registered nurses and which will not, when the needs of their students are identical, is 'tracking' on an even grander scale than perhaps anyone has yet considered" (Downey, 1983, pp. 6-7).

THE CASE FOR COMPREHENSIVENESS

In just over three-quarters of a century, community colleges have evolved from transfer-oriented, largely single-purpose colleges to institutions where breadth of curricular offerings and support services are synonymous with their name. Indeed, some proclaim that comprehensiveness is a necessary condition for an institution to refer to itself as a community college (Reynolds, 1969; Gleazer, 1968; Vaughan, 1978).

Even though the time span between 1901, when Joliet Junior College was founded, and the present can hardly be considered "overnight"; it is a short time in the life of an institution. During this period, the two-year college has responded to dramatic changes in the demands upon the nation's work force, to periods of economic prosperity and disaster, and to major shifts in population demographics. For instance, community colleges geared up to accommodate thousands of World War II veterans, and their progeny 20 years later—the result of the baby boom. These changes led the community college through periods of increasing emphasis on occupational education, to a recognition of a new and expanded role in lifelong learning, to a stronger commitment to community services, and to the growth of compensatory or remedial education as a major function (Thornton, 1972).

Despite the obvious and measurable changes which these social phenomena wrought in the nature and basic functions of the two-year college, none had the impact of the shift in federal policy toward a demand for equal opportunity. The "popularizing" or

"democratizing" function of the community college was recognized from the early days of the community college movement (Koos, 1924); and although the number of community colleges increased steadily during the first half of the century, it was not until the nation committed itself to "equal access to education" that the community college became a prominent, if not dominant, force in American higher education.

The genesis of this inexorable shift toward equal access probably can be traced to the Morrill Act of 1862, which resulted in an increase in the breadth of curricular offerings at four-year colleges and universities (especially in the land-grant colleges) and, concomitantly, in a more heterogeneous student body. This movement away from the classical curriculum prevalent prior to that time paved the way for the true comprehensiveness that was to follow.

But it was Harry Truman who provided the impetus toward equal access as we have come to know it. Truman appointed a national Commission on Higher Education in 1946 and charged it with the responsibility of "examining the functions of higher education and the means by which they could best be performed" (Carnegie, 1973, p. 130).

Several of the commission's findings related directly to the future of the community college.[1] Not the least of these was the use of the term "community college" rather than "junior college." The commission believed that the new term more adequately described the two-year college's evolving role in improving the quality of life, in meeting the educational and cultural needs of the entire community it served; and in lowering barriers to higher education.

The commission noted also that education should be for *all* Americans and suggested that at least 49 percent of the population could benefit from two years of postsecondary educational training. Such a prediction was mind boggling in those days, when only a third of the population over 24 years old had at least a high school education (Carnegie, 1973, p. 177).

Not content merely with laying the philosophical framework for expanded access, the Truman Commission identified five barriers to equal opportunity for higher education. In addition to funding and cost-related concerns and ethnic and religious barriers, the commis-

[1]For a detailed treatment of the work of the commission, see The President's Commission on Higher Education, George F. Zook, Chairman, *Higher Education for American Democracy*, 6 vols., U.S. Government Printing Office, Washington, D.C., 1947. Helpful summaries and analyses are contained in the *Final Report of the Carnegie Commission on Higher Education*, cited above, and in Vaughan, George B. "Historical Perspective: Truman Commission," *Community and Junior College Journal*, 1983, (53)7, 21–24.

sion pointed out the need to accommodate increasing numbers of students in many parts of the country. Further, it highlighted the problem of a restrictive curriculum in light of the expanding student mix which would follow increased access. Identification of these barriers, and the recommendations designed to remove or lower them, provided the needed impetus for community colleges to begin the second half of the century.

Prior to the report of the Truman Commission, higher education was still viewed in this country as a privilege of the few. Now it was to become the right of everyone. Since that time, of course, the nation's commitment to equal access has been restated and reinforced in many ways. Federal legislation, like the Civil Rights and Economic Opportunity Acts, has contributed significantly, as have the provisions for increasing financial aid authorized in the Education Amendments of 1972 and subsequent years. The Higher Education and Higher Education Facilities Acts, with their set-asides for community colleges, were a major force during the boom years of the late 1960s, and the Vocational Education Act of 1963 and amendments of 1968 and 1972 aided community colleges as they expanded high-cost occupational programs on their route to comprehensiveness. Of course, the Carnegie Foundation's 1970 report *The Open Door College* provided a major boost to community college development (Carnegie, 1970).

Although the goal of providing access to higher education to half the population seemed formidable as well as admirable in 1947, that level of participation in higher education is as outmoded today as the automobiles of that earlier era. The National Commission on the Financing of Postsecondary Education, in their 1973 report, stated, "Each individual should be able to enroll in some form of postsecondary education appropriate to that person's needs, capabilities, and motivation" (p. 55). More recently, Boyer and Hechinger (1981) lent support to arguments for expanded access when they concluded " . . . from now on, almost all young people will, at some time in their lives, need some form of postsecondary education if they are to remain economically productive and socially functional in a world whose tasks and tools are becoming increasingly complex" (p. 28).

There seems little question that access is both a national priority and a central mission of the community college; and criticisms about tracking (Karabel, 1972; Pincus, 1980; and Zwerling, 1976) and inequities for minorities (Olivas, 1979) notwithstanding, community colleges have much to be proud of in their efforts to lower the barriers to equal educational opportunity. Yet, despite the impressive growth of community colleges to more than twelve hundred institutions

enrolling nearly five million credit students, access has not been achieved uniformly across the land.

Even though a college education is now within financial reach of most of the population (especially when financial aid programs are considered) and racial and ethnic barriers have been lowered if not erased, distance and restricted curricula still remain and serve as *de facto* barriers to equal access in many areas of the nation. The task of lowering these barriers for the more than 25 percent of the population who reside in 98 percent of the land area of the United States falls, in large part, to small rural community colleges. Yet at least two of the correlates of access—proximity and curricular diversity or comprehensiveness—appear to be difficult to attain.

The large geographic service area characteristic of the small rural college, coupled with population sparsity and, in many cases, poor road networks, make distance a barrier which the small rural college frequently cannot overcome. Cohen and Brawer (1982, p. 10) and Hyde (1982, pp. 66–68) cite evidence supporting the contention that proximity is the most important factor in college attendance.[2] Although the individual college can do little to reduce the size of its service area, institutional strategies can be employed to lessen the effects of distance. Successful strategies are examined and reported in Part 3.

Curricular comprehensiveness is yet another matter. Conventional wisdom holds that small colleges face unique problems in achieving comprehensiveness. Reynolds recommended a model comprehensive curriculum and warned that it would "go far beyond the curriculum of all but the larger, more financially affluent colleges" (1969, p. vi). The Carnegie Commission in *New Students and New Places* reported that "The number of fields in which degrees are offered increases, as does the number of faculty members per field, with increasing size" (1971, p. 78). Cohen also identified the relationship of size to program diversity when he reported curricular differences between small and large colleges, with smaller institutions offering a more limited course selection, frequently restricted to the introductory level (1978, p. 44).

A similar relationship is presumed to exist between funding levels and comprehensiveness (Wattenbarger & Cage, 1974; Reynolds, 1969; Carnegie Commission, 1971; Richardson & Leslie, 1980; and Breneman & Nelson, 1981). Economy of scale studies (Bowen, 1980; Carnegie Commission, 1972; McLaughlin and others, 1980; Allen and

[2]Hyde points out, however, the mediating effect of convenience in when and how courses or programs are offered, especially for older students.

Brinkman, 1983; Mullen, 1981) give at least tentative support for the association of higher unit costs in small institutions and, independent of size, in institutions with diverse curricular offerings.

Representatives of small rural colleges do not have to be reminded of these impediments to comprehensiveness. One of the first official acts of the newly formed Task Force on Small/Rural Colleges was to adopt the following resolution for transmission to the AACJC Board of Directors: "Equal educational opportunity demands that public policymaking bodies provide for comprehensiveness in curriculum and in services in all its community college units regardless of size or geographic location." (Vineyard, 1979, p. 37)

Despite constraints that literally "go with the territory," spokespersons for the small rural colleges see curricular comprehensiveness as vital to access and at least as important to the clients they serve as to residents in districts served by larger colleges. In fact, in many cases small rural colleges are alone in their efforts to provide educational and cultural services to their areas. Vaughan's statement "Our mission demands that we be comprehensive" (1978, p. 35) was supported by Eaton (1981), Gausman (1978), and Mersen, who stated, "One can measure the strength of a community college by the diversity of its programs" (Johnson, 1969, p. 40).

Defining Comprehensiveness. Comprehensiveness is generally defined in terms of the curricular functions performed by an institution. Inevitably, the commonly accepted functions of general education, transfer education, occupational education, continuing education, community services, and remedial/compensatory education are woven into any definition. Frequently, support services such as student development programs are also recognized as crucial to comprehensiveness.

Once these broad curricular functions are listed, then what? Obviously, an institution that offers occupational training only in secretarial science and electronics technology is not as comprehensive as an institution that offers both degree and certificate programs in each of the six occupational clusters reported by HEGIS. What about the college which offers only introductory courses as compared to an institution that manages to achieve both breadth and depth in curricular offerings?

Medsker and Tillery (1971) concluded that there is neither a "single model nor any compelling theory or body of research to use in defining and assessing comprehensiveness" (p. 140). The difficulties in definition and measurement remain today. We view comprehensiveness as a relative term, a concept which can be studied, analyzed,

perhaps even measured, but for which no absolute standard can be derived. Moreover, any consideration of comprehensiveness must extend beyond what is offered to an examination of what is needed. By definition, community colleges attempt to meet the educational needs of their communities. The definition of comprehensiveness differs for each institution, just as the needs of each community and its citizens differ.

It is noteworthy that many rural regions may need more comprehensive programming than is generally suspected. Fitzsimmons and others (1980) noted, "Nonmetropolitan employment growth rates exceeded metropolitan ones in eight out of nine industrial categories between 1970 and 1976" (pp. 494–495). In North Carolina, where economic development and community colleges have been closely linked, 80 percent of recent industrial development has occurred in nonurban areas. Communities of less than 15,000 persons have attracted 60 percent of recent industrial investment (Campbell and Faircloth, 1982). Writing about rural educational needs in general, Kuvlesky and Copp (1981) stated, "Rural youth living in disadvantaged rural areas, particularly minority youth, . . . value attainment of the same kinds of life goals as other youths in the United States; however, they exist in settings that will hinder their achievement of these high aspirations" (p. 26).

Despite the ambiguities surrounding the definition of comprehensiveness and the obvious problems inherent in measurement, the importance of program diversity to attainment of community college mission argues for continued research on this topic. This study represents an effort to describe curricular comprehensiveness as it exists in small rural community colleges, to compare programs at these colleges with those offered in larger institutions, to investigate the role of funding in program diversity, and to explore instructional and managerial strategies employed at the most comprehensive small rural colleges.

DESCRIPTION OF THE STUDY

Data Collection Procedures. Despite the relatively large number of small rural community colleges and the recent increased visibility due in large part to the work of the Small/Rural College Commission, there is a surprising lack of empirical research on these institutions reported in the professional literature. Most of the professional writing tends to be of the impressionistic, intuitive or anecdotal variety:

"These are our problems and here's what needs to be done about them," or "The reason we can't fully realize our mission is. . . ."

This type of dialogue is useful if, for no other reason, it calls attention to the small rural colleges and their crucial role in providing access to higher education for millions of Americans. What it does not do, however, is provide a data base or a collection of research studies that can be replicated to build a common body of research on the small rural college, its characteristics, its problems, and possible solutions to those problems. The only national study that we could locate was a 1978 survey of community college presidents who identified major problem areas. Comparisons were then drawn between small rural and large institutions. This research was reported by Ross (1979) and Nelson (1979).

As interesting and useful as these data were, they were of limited value in answering the questions posed in this study. To be able to describe the curriculum in the small rural colleges and to assess the degree of comprehensiveness in those institutions, new data had to be collected and analyzed. The data used in the study at hand came from two principal sources: selected enrollment, financial, and occupational degree data available from the National Center for Educational Statistics through the Higher Education General Information Survey, and a national survey conducted by the authors of this monograph. A brief description of each instrument and the derivation of the sample groups follow.

The HEGIS Survey. The HEGIS data are collected annually from a very high percentage of U.S. postsecondary institutions. The types of data include student and faculty characteristics, revenues and expenditures, and degrees and other formal awards. The financial data are generally considered to be among the best and most complete available to researchers and policy analysts and will be discussed in more detail in Part 3 of this monograph. The "degrees awarded" data are extremely useful for analyzing offerings in occupational-technical fields; they are of little value in studying other components of the community college curriculum, however, because all nonoccupational curricular areas are subsumed under the single category "Arts and Science or General" Programs.

The data on occupational-technical degrees provide a detailed data base not only for the number of degree graduates, but also for the number of recipients of diplomas, certificates, or other formal awards below the level of the associate degree. The survey includes information on 69 different programs, ranging from accounting technologies to police and law enforcement, from Bible study or religion-related

occupations to psychiatric technologies, from animal laboratory assistant technologies to sanitation technologies, and nearly any other occupational-technical curriculum one can imagine.

These 69 programs are categorized into six clusters of related curricula: data processing technologies, health services and paramedical technologies, mechanical and engineering technologies, natural science technologies, business and commerce technologies, and public service related technologies. The number of programs within each cluster ranges from a low of 5 in the data processing cluster to 19 in the health services and paramedical cluster. Data on occupational-technical programs from the 1980–1981 HEGIS tapes formed the data base for analyzing the occupational component of a curriculum.[3]

The Small Rural College Survey. Enrollment and financial data as well as information on occupational-technical programs were readily available from the HEGIS data tapes; however, no useful material was available for the comparison of transfer curricula. The authors designed a questionnaire to solicit both transfer course and degree data from a wide range of two-year colleges. That part of the questionnaire most pertinent to the description of an institution's transfer curriculum is reproduced in Table 2.

[3]For degrees and "other formal awards" the number of recipients of awards in each curricular area is provided by HEGIS, but enrollment figures are not. HEGIS data provide information as to whether one or more awards were made in a given program during a twelve-month period. Productivity figures obviously are important to the institution as measures of efficiency and program health; low output could, of course, bring about program closure over time. For the student, the existence or availability of a program is a better measure of access than is the size of the program.

Table 2

Questions Designed to Collect Data
on Transfer Courses and Programs

Program Items		
A. Can students at your institution complete university parallel sequences leading to transfer acceptance at the *junior* level in:	Yes	No
1. Architecture	( )	( )
2. Engineering/Architecture	( )	( )
3. Agriculture	( )	( )
4. Business Administration	( )	( )
5. Teacher Education	( )	( )
6. Fine/Performing Arts	( )	( )
7. Liberal Arts	( )	( )
8. Mathematics	( )	( )
9. Natural or Physical Sciences	( )	( )
10. Computer Sciences	( )	( )
Course Items		
B. Does your institution offer:		
Two years in one or more foreign languages	( )	( )
One year each of three or more laboratory sciences	( )	( )
Two years of one or more laboratory sciences	( )	( )
One year of mathematics beyond calculus	( )	( )
One year of one or more behavioral/social sciences (psychology, sociology, etc.)	( )	( )
One year each of two or more history or government sequences	( )	( )
One year each of two or more literature sequences	( )	( )
One year of philosophy/humanities	( )	( )
One year of physical education activity	( )	( )
At least one course in health, first aid, or nutrition	( )	( )
Courses in art and/or music appreciation	( )	( )
Studio courses in art	( )	( )
Performance courses in vocal and/or instrumental music	( )	( )

The combination of questionnaire results and HEGIS data into an index of comprehensiveness is discussed in the following section.

Measuring Comprehensiveness. Several basic assumptions guided the design of this study and the construction of an index by which the degree of curricular comprehensiveness in a community college can be measured. First of all, we believe that a diverse set of program offerings is inextricably linked to the community college concept and critical to attainment of an institution's mission. We also recognize that, despite great commonality in curricular offerings from one community college to another, a curriculum is idiosyncratic. Because each community is different and each institution is different, so should be the curricular composition of each college. In fact, curricular uniformity is antithetical to the concept of *community* college. This leads, of course, to our concept of comprehensiveness as a *relative* term with a rigid definition not only impossible to derive but also undesirable.

Nonetheless, we were convinced that wide disparities in comprehensiveness exist, even in institutions of similar size in similar communities with like characteristics, including pattern of control and level and source of funding. Guided by these assumptions and our convictions about the range of comprehensiveness extant in small rural colleges, we set out to devise an index to measure relative comprehensiveness.[4] The index is limited to the measurement of *credit* offerings. The principal reason for the omission of noncredit offerings is the ambiguity and inconsistency inherent in the reporting procedure (Atwell, Vaughan and Sullins, 1982). Community education enrollments, although useful in a general sense, defy reliable quantification.

We intended initially to include remedial or compensatory offerings in our calculations, but we soon discovered that these offerings, as crucial as they are to program comprehensiveness and mission attainment, failed to discriminate among institutions because essentially everyone offered them. Of the 160 small rural colleges included in our study, only one failed to offer remedial courses in mathematics and either reading or composition. In fact, only three failed to offer work in both reading and composition. In effect, then, remedial programs, which we considered to be a necessary condition

[4]Designing of the comprehensiveness index was done primarily by Louise Kaplan, a doctoral candidate in community college education at VPI&SU. A more detailed description of the construction of the index can be found in her forthcoming dissertation, "A Study of Curricular Comprehensiveness in Small Rural Community Colleges."

for comprehensiveness, can be assumed to exist, at least to some degree, in all the institutions, regardless of size or location.

We also recognize the vital role which support services such as counseling, appraisal, placement, advisement, veterans' affairs, and financial aid play in undergirding a comprehensive program. An analysis of these support services will be published separately.

The Comprehensiveness Index. This index measures the breadth and depth of an institution's *credit* offerings in both transfer and occupational-technical areas. The index was derived by calculating separate indices for the transfer and occupational-technical (O-T) components of a curriculum. The separate measures then were weighted by assigning a value of 40 percent to the transfer index and 60 percent to the O-T index.[3] The adjusted or weighted indices then were combined to form the total comprehensiveness index.

A complete description of the transfer and occupational-technical indices is included in Appendix A.

The Sample. The accessible population for the study of small rural colleges was comprised of those public two-year colleges (1) who awarded associate degrees or other formal awards both in the arts and sciences and in at least one occupational-technical curriculum; (2) who had headcount enrollments of 2,500 or less; (3) who designated themselves as "rural" on a questionnaire distributed annually by AACJC (AACJC, 1982b); and (4) for whom complete HEGIS data were available. When these criteria were applied to both the HEGIS and AACJC data sources, 248 institutions were identified. A total of 160 small rural colleges, or 65 percent of this population, returned all questionnaires and survey forms and thus form the sample upon which this study is based. These colleges represent 37 states and range in headcount from 326 to 2,492 students, with a mean enrollment of 1,298 students.

Two groups were also identified and surveyed to compare with small rural colleges. The HEGIS data source contained data on 73 institutions which fit our definition of smallness but which, according to AACJC data, had not listed themselves as rural when responding to the annual survey. Thirty-eight, or 52 percent, of these small nonrural institutions responded to our survey. These colleges are included as a comparison group because of the belief in some quarters (Cohen, 1978)

[3]These weights approximate the proportion of total credit enrollments represented in each curriculum.

that "ruralness" may be far less important than size in explaining differences among institutions.

To determine the relative accuracy of an institution's self-designation as rural on the AACJC's annual survey, we compared the total population of small rural colleges and our sample to U.S. Census Bureau data that included proximity to a Standard Metropolitan Statistical Area (SMSA). Of those colleges designated as rural on the AACJC listing, 89 percent were located outside *any* SMSA (See Table 3). The study sample was similar to the total population of rural colleges in relative agreement between self-designation and location using U.S. Census Bureau information.

Table 3

Number and Percent of Colleges in Population and Sample Outside Any SMSA (Standard Metropolitan Statistical Area)

	Population			Sample		
Colleges	Total N	Total N Outside SMSA	%	Total N	Total N Outside SMSA	%
Very Small Rural (1–999)	77	72	94%	52	51	98%
Small Rural (1,000–2,499)	171	150	87%	108	92	85%
Total	248	222	89%	160	143	89%
Small Nonrural (1–2,499)	73	40	54%	38	23	60%

To make funding and curricular comparisons among institutions of different sizes, a random sample of 100 public two-year colleges with headcount enrollments exceeding 2,500 students was drawn from the same HEGIS data. Forty-four of these large institutions responded to the survey, and they form the large college comparison group (see Table 4).

Even though we intended to utilize data collected from large community colleges only for gross comparisons by institutional size,

the low response rate was troubling. Accordingly, we compared a number of variables between responding (N = 44) and nonresponding colleges (N = 56) from our original sample of 100 large institutions. No significant differences ($p < .05$) between respondents and nonrespondents existed on the variables of headcount enrollment, IEG/FTE (our cost measure), or occupational-technical comprehensiveness, all available through HEGIS. Since data from which transfer comprehensiveness was calculated were not available from nonrespondents, comparisons on that variable could not be made.

The results of the survey and subsequent data analysis are reported in Part 2.

Table 4

Number and Type of Institutions Comprising the Study

Institutional Type	Accessible Population/ Sample	Number Responding	Percent Responding
Small Rural	248	160	65%
Small Nonrural	73	38	52%
Large	100	44	44%
Total	421	242	57%

PART 2. THE CURRICULUM

INTRODUCTION

In Part 1 we demonstrated the importance of curricular diversity to mission attainment for community colleges. Comprehensiveness, considered much more difficult to achieve in the small rural college, is no less critical in meeting student and community needs. In this section we report the findings of a national survey designed to determine the status of curricular comprehensiveness in small rural community colleges. Additionally, we drew comparisons between small rural colleges and other two-year colleges of different sizes and settings.

Our research was guided by a number of postulates which, though for the most part untested, tend to provide the framework on which conventional wisdom about the small rural college is founded. Some of the more commonly held beliefs about the small rural college and comprehensiveness are (1) curriculum comprehensiveness is directly related to enrollments, with larger institutions providing more diverse program offerings; (2) comprehensiveness is dependent upon a level of funding which small rural colleges find difficult to attain; (3) small rural colleges do not get their fair share of federal funds; and (4) most state funding formulas fail to recognize and compensate for the increased cost of doing business in small rural colleges.

Are these statements accurate? Most, on the face of it, appear reasonable and logical; and those who work in these institutions and who write about their labors attest to such accuracy. Our purpose is to provide data-based answers to these and other questions about small rural community colleges. This portion of the monograph is devoted to describing the credit curriculum in small rural colleges and to drawing comparisons with other institutional types. In Part 3 we address the relationship of financial support to comprehensiveness and examine institutional strategies practiced at colleges which, despite the odds, have been able to achieve and maintain curricular diversity.

Curriculum has been variously defined as "what takes place in the classroom when the teacher closes the door" and "all of the planned experiences which an institution provides for its students." Depending upon one's point of view and level of analysis, both definitions are probably correct. For our purposes, we have chosen a middle ground and in this study refer only to the "credit" curriculum, that is, only

those courses and programs of study for which college credit is awarded.

This choice represents more a decision of convenience than one of philosophy. In fact, we have written previously about the importance of community services in the community college (Atwell and Sullins, 1977; Atwell and others, 1982) and we recognize as well the value of support services, such as counseling, advisement, and learning resources, in undergirding the curriculum. As important as these activities are, however, they are *support* services; the credit curriculum is the educational focus of the institution.

THE TRANSFER CURRICULUM

Our assessment of the transfer curriculum is based upon the availability to students of associate of arts (AA) and associate of science (AS) *programs* in ten areas representing breadth in the liberal arts and sciences and pre-professional fields. These ten programs are listed in Table A.1. A program was considered "available" only if completion of the stated curriculum resulted in transfer acceptance at the junior level. Additionally, we analyzed offerings in 13 different *courses* or *course sequences.* These courses, listed in Table A.2, were considered to represent a reasonable level of both breadth and depth of offerings in the liberal arts and sciences and supporting fields.

An analysis of program offerings in 160 small rural colleges revealed that students in over half of the colleges can complete pre-professional or liberal arts and sciences programs in nine of the ten fields examined (see Table 5). Architecture, available in only about one-third of the colleges, is the exception. Engineering and agriculture are offered in a majority of the institutions and several programs—teacher education, business administration, liberal arts, mathematics, and natural sciences—are offered in 85 percent or more of the colleges.

The data contained in Table 5 also permit comparisons between program availability in small rural colleges and two other categories of two-year institutions, small nonrural, and large. A comparison of these figures showed little difference (none significant at the .05 level) in program availability between rural and nonrural small colleges. Rural colleges were slightly more likely to offer programs in agriculture—certainly no surprise—and mathematics, natural sciences, and teacher education. Small nonrural colleges lead in business administration programs. Again, none of these program differences were statistically significant.

However, a comparison of program availability between small rural colleges and large colleges yielded markedly different results. Large colleges were more likely to offer associate degree programs in architecture ($p < .05$), engineering ($p < .05$), natural sciences ($p < .01$) and computer science ($p < .05$). Small rural colleges led in program availability only in agriculture, business administration and teacher education with none of the differences significant at the .05 level of confidence.[1]

Table 5

Percent of Colleges Offering Selected Transfer Programs by Institutional Size and Setting

Program	Small Rural (N=160)	Small Nonrural (N=38)	Large (N=44)
	%	%	%
Architecture	32.5	31.6	50.0
Engineering	56.9	55.3	75.0
Agriculture	59.4	55.3	47.8
Business Administration	96.3	100.0	95.5
Teacher Education	86.9	81.6	84.1
Fine Arts	61.9	60.1	84.1
Liberal Arts	95.0	92.1	100.0
Mathematics	85.6	78.9	95.5
Natural Sciences	86.3	76.3	97.7
Computer Science	75.0	76.3	81.8

[1]Some readers will be interested only in comparing proportions or other kinds of purely descriptive statistics. Others will not be satisfied merely to inspect an array of data and speculate on how important the observed differences are. Therefore, data from this study will be presented so that both types of readers will be served. A word of caution is due, however. When sample sizes are very small, important *practical* differences frequently are not shown to be *statistically* different (with a reasonable amount of statistical precision). Conversely, when sample sizes become extremely large, almost any measured difference (including those of less than practical importance) will be statistically significant. By maintaining a precision level of .05 with the moderate size of our sample, we believe that statistical differences and practical differences are, for the most part, equivalent in this study.

Analysis at the *program* level might be considered the broad brush approach. A more detailed look at the transfer curriculum takes place at the individual *course* and *course sequence* level. Data pertaining to these offerings are displayed in Table 6.

As was true with degree *programs,* most small rural community colleges offer the vast majority of the *courses* or *sequences* about which we inquired. Over 80 percent of the colleges offered most of the sequences examined, and fewer than 60 percent of the schools offered two years of foreign languages and mathematics beyond calculus. The relative unavailability of courses in foreign languages, philosophy and humanities, and performance courses in music was consistent with the relatively small proportion (61.9 percent) of colleges that offered transfer programs in the fine arts. Similarly, the lack of opportunities for students to take courses in advanced mathematics matched the smaller number of transfer programs in engineering and computer science.

When course/sequence comparisons were made between small rural and small nonrural community colleges, no significant differences were noted. Students attending small rural colleges were more likely to find courses in foreign languages and advanced mathematics, activities courses in physical education, and studio art experiences. None of these differences were significant at the .05 level, however.

Again, comparisons of small rural colleges with larger institutions supported the contention that curricular diversity increases with size. With the exception of what might be called core courses or sequences that practically all institutions offered, such as a year or more of social science and history, a course or courses in health or nutrition, or art or music appreciation, large colleges were much more likely to offer the courses or sequences examined in foreign languages, three different lab sciences, advanced mathematics, and philosophy or humanities courses.

Table 6

Percent of Colleges Offering Selected Courses/Sequences by Institutional Size and Setting

Courses/ Sequences	Small Rural (N=160)	Small Nonrural (N=38)	Large (N=44)
	%	%	%
Foreign Language	55.6	42.1	81.8
Lab Science 3[1]	88.8	86.8	97.7
Lab Science 1[2]	83.1	81.6	90.9
Calculus Plus	57.5	42.1	63.6
Social Science	95.0	97.4	97.7
History	90.0	94.7	93.2
Literature	83.8	89.5	86.4
Philosophy/ Humanities	63.8	68.4	90.9
Physical Education	86.9	71.1	90.9
Health/ Nutrition	95.0	92.1	95.5
Art/Music Appreciation	96.9	97.4	97.7
Studio Art	84.4	76.3	95.5
Performance Music	68.8	68.4	81.8

[1]One year each of three or more laboratory sciences.
[2]Two years of one or more laboratory sciences.

An examination of the unadjusted transfer comprehensiveness index scores permits a more quantitative analysis of comprehensiveness in these three categories of institutions. These scores, calculated as described previously, are reported in Table 7. Because the enrollment range in each size category allowed for considerable intra-group variation—for example, headcount enrollments ranged from 326 to 2,492 in the small rural colleges and from 2,568 to 28,351 in large colleges—further size categories were created for this analysis. Small rural colleges were divided at an enrollment of 1,000; the 52 schools with headcounts under 1,000 comprised one group, and those with headcounts from 1,000 to 2,499 formed the second group. Large colleges were divided at a headcount of 5,000; those institutions with enrollments of 2,500 to 4,999 (N=18) formed one group, and those

with headcounts in excess of 5,000 (N=26) formed the other. Because only seven of the small nonrural colleges had enrollments of less than 1,000, all 38 small nonrural colleges were treated as a single group.

An inspection of the transfer comprehensiveness scores, calculated simply by adding the various point values assigned to each degree program and course/sequence, showed remarkable intra-group similarity. Statistical tests (t tests between mean scores) showed no significant differences between the two size categories of small rural colleges or between all small rural colleges and small nonrural schools. Similarly, there was no significant difference in transfer comprehensiveness scores between the two size categories of large colleges.

Comparisons between transfer curricular diversity in small versus large colleges yielded quite different results. Just as major differences were evident in the proportion of institutions that made certain programs and courses available to their students, so were there differences in the more quantitative approach to measuring comprehensiveness. Large community colleges offer more comprehensive curricula than small colleges, rural or otherwise.

Table 7

Comparisons of Transfer Comprehensiveness by Institutional Size and Setting

Institution	Unadjusted Transfer Index
Small Rural	
1–999[1] (N=52)	75.10
1,000–2,499 (N=108)	76.31
Total Small Rural (N=160)	75.91
Small Nonrural (N=38)	73.61
Large	
2,500–4,999 (N=18)	83.61
5,000+ (N=26)	83.62
Total Large (N=44)	83.61

[1]Headcount enrollments

What do these results tell us about the transfer curricula in community colleges? First of all, even small community colleges are able to offer to their students a fairly diverse curriculum. With certain notable exceptions—*programs* leading to transfer at the junior level in architecture, agriculture, engineering and fine arts, and *courses/sequences* in foreign languages, advanced mathematics beyond calculus, philosophy/humanities and performing courses in music—the vast majority of small colleges offer all the options we examined. Moreover, little difference emerged between very small rural colleges and other rural colleges enrolling over 1,000 students; nor were there substantial differences between small colleges based on their rural or nonrural setting.

It is clear, however, that colleges enrolling 2,500 or more students were able to offer transfer programs significantly more diverse than those offered by smaller colleges. Once an institution reaches an enrollment level of 2,500, it appears to experience no appreciable gain in transfer comprehensiveness. The ability of institutions larger than 2,500 students to offer more sections of courses at different times on different days and even at different teaching sites may increase program flexibility, and thus access. Because of this ability of larger colleges, the differences reported here between small and large institutions are understated.

THE OCCUPATIONAL-TECHNICAL CURRICULUM

Transfer education is an important plank in the platform of the community college. Historically the dominant curricular function, transfer programs remain vital to curricular comprehensiveness. Over the last two decades, however, job preparation has become the driving motivation for a majority of community college students. More than 60 percent of all community college students enroll in occupational-technical programs (Cohen & Brawer, 1982, Chapter 8), and the current emphasis on high technology can only increase the interest in and demand for these curricula.

In all institutions—large and small; rural, suburban, and urban—opportunities for occupational training are crucial to curricular comprehensiveness. How successful are small rural community colleges in providing program choice to their students seeking preparation for work? The occupational-technical component of the comprehensiveness index, described previously and in Appendix A, provides a way to examine these program offerings.

The maximum score attainable on the occupational-technical index, adjusted for the varying number of curricula in each of six clusters, is 38 per cluster or 228 (38×6). To achieve the maximum score an institution would have to offer both a degree and a lower-level award (certificate or diploma) in 69 different programs. No college, whatever its size and complexity, offers such a curriculum. In fact, a maximum score is probably not possible to achieve because a few of the programs, such as licensed practical nursing, are not normally offered at both the diploma/certificate and degree levels.

An inspection of the occupational-technical programs in small rural colleges revealed a wide range of comprehensiveness, from an occupational-technical index of 7.2 (representing one program in the health services cluster) to a score of 113.91 (20 different programs or

levels representing all six occupational clusters). The data in Table 8 provide two ways to compare occupational-technical offerings in small rural colleges. First, the percentage columns indicate what proportion of the responding colleges offer at least one curriculum in each occupational cluster. For example, only 11.5 percent of the very small colleges (headcount less than 1,000) offer any program at any level in data processing technologies, while 45.4 percent of colleges in the 1,000 to 2,499 headcount range have at least one such program. These figures provide some indication of breadth of offerings across the six occupational clusters.

The occupational-technical index, on the other hand, measures not only breadth but depth within each cluster as well. With the exception of the natural science technologies, very small colleges are significantly less comprehensive than their larger rural counterparts. Both groups of institutions are most likely to offer at least one program in business, mechanical engineering, and health technologies and least likely to offer data processing. Program choice *within* occupational clusters is likely to be extremely limited in the very small college and available only in the business, mechanical engineering, and public service technologies even in the next size category.

Table 8

Comparison of Mean Occupational-Technical Indices and Percentages of Program Offerings in Small Rural Colleges

	Very Small Rural (N=52)		Small Rural (N=108)	
	%	Index	%	Index
Data Processing	11.5	2.22[1]	45.4	7.31[1]
Health Services	73.1	6.15[1]	88.9	8.86[1]
Mechanical Engineering Technology	69.2	8.40[1]	88.9	13.04[1]
Natural Science Technology	55.8	7.67	58.3	8.61
Business Technology	96.2	15.35[1]	100.0	17.68[1]
Public Service Technology	51.9	6.87[1]	75.0	12.25[1]
Total Occupational-Technical Index		46.67[1]		67.80[1]

[1]Significant at the .05 level

Analyses of transfer curricula, you will recall, revealed no significant differences between small rural and small nonrural community colleges. Comparisons of the occupational-technical curricula yield the same results. Significance tests (t tests) comparing the mean occupational-technical index scores, both for individual clusters and total score, show no significant differences at the .05 level of confidence. Students are slightly more likely to find data processing programs in the nonrural college and less likely to have access to a program in the natural science technologies. These differences doubt-

less express the nature of the communities in which the colleges are located, with programs in agriculture, horticulture and forestry, all in the natural science cluster, logically in greater demand in the rural setting. These figures are provided in Table 9.

Table 9

Comparisons of Mean Occupational-Technical Indices and Program Offerings Between Small Rural and Small Nonrural Community Colleges

	Small Rural (N=160)		Small Nonrural (N=38)	
	%	Index[1]	%	Index[1]
Data Processing	33.8	5.70	48.6	7.48
Health Sciences	83.3	7.98	78.9	8.49
Mechanical Engineering Technology	82.5	11.53	78.9	10.66
Natural Science Technology	57.5	8.30	36.8	5.62
Business Technology	98.8	16.92	100.0	17.13
Public Service Technology	67.5	10.50	68.4	11.46
Total Occupational-Technical Index		60.93		61.20

[1]None significant at the .05 level.

A comparison of occupational-technical program diversity between small rural and large community colleges revealed even more striking differences than was true for the transfer curriculum. Table 10 contains data displaying the proportion of institutions offering pro-

grams within each of the six occupational-technical clusters as well as adjusted scores on the occupational-technical component of the comprehensiveness index. An inspection of the data reveals that in health and business technologies there is little difference (none significant at the .05 level) between institutional categories and a student's likelihood of finding at least one program offered in a given occupational cluster. In data processing, mechanical engineering, natural sciences, and public service technologies, students in large community colleges were significantly more likely to find at least one occupational curriculum.

When we compared occupational-technical index scores, to measure depth and variety of offerings within clusters, the differences were even more pronounced! The differences in mean index scores between small rural and large institutions were significant for *each* cluster and the total score.

Table 10

Mean Occupational-Technical Indices and Percentage of Schools Offering Programs by Occupational-Technical Clusters and Size and Setting

	Small Rural Colleges (N=160)		Large Colleges (N=44)	
	%	Index	%	Index
Data Processing	33.8[1]	5.70[1]	84.1[1]	14.75[1]
Health	83.3	7.98[1]	88.6	12.14[1]
Mechanical Engineering	82.5[1]	11.53[1]	100.0[1]	17.19[1]
Natural Sciences	57.5[1]	8.30[1]	79.5[1]	14.28[1]
Business	98.8	16.92[1]	100.0	20.99[1]
Public Service	67.5[1]	10.50[1]	86.4[1]	17.61[1]
Total Occupational-Technical Index		60.93[1]		96.95[1]

[1]Significant at the .05 level

A comparison of index scores between size categories of large institutions serves further to reinforce the relationship between size and program diversity (see Table 11). Index scores on the health,

natural sciences, business, and public service technologies as well as the total adjusted occupational-technical score were significantly higher in colleges enrolling over 5,000 students than in colleges in the 2,500 to 4,999 category. Add to this finding the significantly greater occupational-technical diversity in the larger size category of small rural colleges (see Table 8), and the picture of increasing diversity with size becomes clear. From the data available, we are unable to say whether the size/diversity relationship will hold for other institutional groupings—say 5,000 to 10,000, 10,000 to 15,000 and 15,000 and up—but it is patently obvious that size is more important to comprehensiveness in the occupational-technical curriculum than in transfer programs.

Table 11

Comparisons of Mean Occupational-Technical Indices and Program Offerings Between Size Categories of Large Community Colleges

	2,500 – 4,999 (N=18)		5,000+ (N=26)	
	%	Index	%	Index
Data Processing	77.8	13.60	88.5	15.55
Health	83.3	9.84[1]	92.3	13.74[1]
Mechanical Engineering	100.0	16.00	100.0	18.01
Natural Sciences	61.1	9.83[1]	92.3	17.36[1]
Business	100.0	19.56[1]	100.0	21.97[1]
Public Service	77.8	14.17[1]	92.3	19.99[1]
Total Occupational-Technical Index		82.99[1]		106.62[1]

[1]Significant at the .05 level

TOTAL COMPREHENSIVENESS

One further analysis seems warranted. The adjusted transfer and occupational-technical indices were weighted (transfer = 40 percent; occupational-technical = 60 percent) and merged in the construction

of the total comprehensiveness index (CI). Tables 12 to 14 contain CI scores for all institutional groupings.

Previous analyses showed no statistically significant differences in transfer comprehensiveness between the two size categories of small rural colleges or between small rural colleges and small nonrural schools. Similarly, transfer comprehensiveness in the two size categories of large community colleges did not differ significantly. Significant differences did exist, however, in transfer program diversity between rural and nonrural small colleges and large colleges.

Differences in occupational-technical comprehensiveness were much more pronounced and more closely tied to enrollment levels. Statistically significant differences existed between mean occupational-technical index scores at every enrollment category: between the two groups of small rural colleges, between the two categories of large colleges, and between small rural and large institutions. Conversely, occupational-technical comprehensiveness between small rural and small nonrural colleges did not differ significantly.

Analysis of the total comprehensiveness index scores revealed that the differences in the occupational-technical offerings apparently overcame the similarities in transfer programs within small institutions. The small rural colleges with 1,000 or more students had significantly higher scores on the total CI (see Table 12).

Table 12

Mean Comprehensiveness Index Score,
Small Rural Colleges

Size Category	Mean Headcount Enrollment	Adjusted Transfer Index	Adjusted O-T Index	Total Comprehensiveness Index
1–999 (N=52)	689	11.87	4.67[1]	16.53[1]
1,000–2,499 (N=108)	1,685	12.06	6.78[1]	18.84[1]

[1]Significant at the .05 level

Larger colleges with enrollments in excess of 5,000 were more comprehensive than those with enrollments between 2,500 and 4,999 (see Table 13), and large colleges as a group were more comprehensive than small rural colleges (see Table 14).

Table 13

Mean Comprehensiveness Index Scores, Large Colleges

Size Category	Mean Headcount Enrollment	Adjusted Transfer Index	Adjusted Occupational-Technical Index	Total Comprehensiveness Index
2,500–4,999 (N=18)	3,408	13.21	8.30[1]	21.51[1]
5,000+ (N=26)	10,245	13.21	10.66[1]	23.87[1]

[1]Significant at the .05 level

Table 14

Mean Comprehensiveness Index Scores, All Colleges

Size Category	Mean Headcount Enrollment	Adjusted Transfer Index	Adjusted Occupational-Technical Index	Total Comprehensiveness Index
Small Rural (N=160)	1,298	11.99	6.09	18.09[1]
Small Nonrural (N=26)	1,833	11.63	6.12	17.75[1]
Large (N=44)	7,446	13.21	9.70	22.91[1]

[1]Mean CI scores of large colleges significantly higher ($p<.05$) than mean CI scores of small rural or small nonrural.

What do these findings mean? First of all, we can answer with relative certainty two of the questions posed at the beginning of this study. Program diversity *is* directly and strongly linked to enrollment. Although even very small colleges with fewer than 1,000 students appear able to offer a reasonable transfer curriculum, any pretense at

comprehensiveness in occupational training opportunities requires a student mass that is not possible in many community colleges. Nearly half of the colleges with enrollments under 1,000 offered only a secretarial science or business management program and one other career option, usually either nursing or engineering technology.

Second, our findings support suspicions expressed earlier (Cohen, 1978) that "ruralness" is less a factor in curricular comprehensiveness than is size. We found few differences in program characteristics between small rural and small nonrural colleges.

Despite the unequivocal nature of the relationship between size and program diversity, a substantial range of comprehensiveness was evident within each size category. Apparently some institutions, even with small enrollments, are able to provide a level of program diversity far greater than other colleges of similar size and, in several cases, greater even than institutions with significantly higher enrollments. Such occurrences raise important questions. Are some colleges subsidized at a level which will permit this increased comprehensiveness? Or does comprehensiveness result from collaboration with other colleges and with other agencies? Or does it come about as a result of increased efficiencies and insightful management?

In the next section we examine the relationship of financial support to comprehensiveness and address strategies employed by small colleges which have achieved a relatively high level of comprehensiveness.

PART 3. THE CORRELATES OF COMPREHENSIVENESS

INTRODUCTION

We have demonstrated the strong, positive relationship between size (headcount enrollment) and curricular diversity (comprehensiveness index). Tables 12, 13, and 14 reveal statisticaliy significant differences in mean comprehensiveness index scores between small colleges, rural and nonrural, and large colleges, and between size categories within the small rural and the large college groupings.

In this section we focus principally on the 160 small rural colleges, and examine more closely the variation in comprehensiveness among these institutions. Table 15 contains data pertaining to the dispersion of CI scores for all institutions by size and setting. The *median* comprehensiveness index scores for small rural colleges was 18.38, with scores ranging from a low of 7.60 to a high of 25.30. Even within the two size categories, fewer than 1,000 students and from 1,000 to 2,499 students, program diversity varied. For example, among the very small institutions, the most comprehensive college had CI scores more than three times higher than those of the least comprehensive institution. Even in the 1,000 to 2,499 size group, the college with the highest score was two and one-half times more comprehensive than the college with the lowest score. Although variation in comprehensiveness exists within all size categories, none showed the range of program diversity found among small rural colleges.

Table 15

Dispersion of Comprehensiveness Index Score, by Institutional Size and Setting

	Low	1st Quartile	Median	3rd Quartile	High
Small Rural					
1–999 (N=52)	7.60	14.71	16.79	18.80	24.29
1,000–2,499 (N=108)	9.80	16.91	19.30	21.32	25.30
Total Small Rural (N=160)	7.60	15.77	18.38	20.57	25.30
Small Nonrural (N=38)	12.01	15.47	18.09	19.42	24.06
Large					
2,500–4,999 (N=18)	17.38	19.29	21.45	24.03	25.52
5,000+ (N=26)	14.75	22.16	24.45	25.15	30.34
Total Large (N=44)	14.75	21.07	23.03	25.04	30.34
All Colleges (N=242)	7.60	16.29	19.06	21.68	30.34

Unarguably, size is a strong predictor of comprehensiveness, but even when controlling for differences in enrollment, wide variation in program diversity exists. Why does one small college offer a very limited curriculum with only one or two career options and another, similarly located, offer a wide range of curricular options including 15 or more occupational-technical programs?

In this section we attempt to answer this question as we examine the relationship of funding levels and delivery strategies to comprehensiveness.

FUNDING COMPREHENSIVENESS

Eavesdrop on a group of community college presidents at any meeting and the topic of conversation will, without fail, turn to problems of financial support. Even before the so-called anxious eighties, adequate financing was an area of concern for those whose task was to manage community colleges (Lombardi, 1973; Wattenbarger & Cage, 1974). More recently, two of the most discussed publications about community colleges focused on finance: the Breneman and Nelson (1981) treatise on financing from the perspective of economics; and the Richardson and Leslie (1980) monograph that tied financial support to the changing mission of the community college.

If anything, concern about adequate financial support—and, more important, what to do in the face of inadequate support—is even greater today than when Breneman and Nelson and Richardson and Leslie were writing. Increases in state appropriations for higher education for 1982–1983 were the smallest in more than twenty years. When last year's increases were adjusted for inflation, half of the states showed an actual decline in support for higher education (Magarrell, 1982). There is some hope of improvement for 1983–1984 (Magarrell, 1983), but problems in adequate financial support persist. For example, California's more than one hundred two-year colleges were forced to absorb a budget cut of $108.5 million—nearly 8 percent—between 1982–1983 and 1983–1984 (McCurdy, 1983).

Throughout the country, colleges have employed a variety of measures designed to make limited dollars go farther to soften the impact of reduced resources. These strategies have included deferred maintenance, enrollment caps, drastic reductions in summer school programs, reduction in the number of part-time faculty, delay of new program start-ups, and, in more severe cases, elimination of programs and release of full-time, contract faculty.

Nearly all of these practices have affected the curriculum, and in most cases, budget reductions have had a potentially more deleterious effect upon small colleges than upon large ones. In this section we examine the level of financial support for small colleges and the relationship of funding, both source and amount, to curricular comprehensiveness, and we compare funding of small rural colleges and other two-year colleges.

Revenue: How Much and From Where. Community colleges receive the lion's share of their operating revenues from three sources: the state, the locality, and the student. Although small amounts are received from federal sources, mostly targeted financial aid funds or

direct grants such as Title III, and from auxiliary funds such as bookstores, food services, and similar operations, these sources rarely provide substantial (more than 5 percent) funding. In recent years, the state has become the major source of funds in all states and, in several, the only significant non-student source available to colleges.

Dougherty and others (1982) reported that, of the 49 states that have public two-year colleges, 34 (over two-thirds) provided half or more of the 1981–1982 operating revenues for community colleges. The median proportion of operating funds provided by the state was 63 percent ranging from just under 20 percent in Wisconsin to over 90 percent in Delaware, Massachusetts, and Washington. In 21 states no local effort is required (or even *permitted*) in many cases. Local funds comprise one-fourth or more of operating revenues in only 12 states.

Data from our sample of community colleges—242 colleges representing 37 states—reflect this same pattern of revenue (see Table 16). Small rural colleges receive two-thirds of their operating revenues from the state and about one-sixth each from student tuition and fees (16.2 percent) and local sources (16.0 percent). Federal funds amount to only 1.6 percent of all operating funds, less than $50 per FTE student.

Large community colleges rely more heavily on student tuition (20.7 percent) and local funding (20.3 percent) for revenue and, conversely, receive a smaller proportion of their total revenues from the state (57.8 percent). Federal support (1.3 percent) also plays a minor role in the revenue picture for large colleges.

Table 16

Mean Revenue Per FTES, by Source of Funds and Institutional Size and Setting, 1980–1981

Institutional Size & Setting	Source of Funds: Tuition $/FTE	Tuition %	State $/FTE	State %	Local $/FTE	Local %	Federal $/FTE	Federal %	Total Revenue[1] $/FTE	Total Revenue[1] %[2]
Small Rural										
1–999 (N=52)	$502	15.7%	$2,314	71.2%	$343	10.7%	$44	1.4%	$3,203	100
1,000–2,499 (N=108)	468	16.5	1,790	63.0	534	18.8	49	1.7	2,841	100
Total Small Rural	479	16.2	1,960	66.2	472	16.0	47	1.6	2,958	100
Small Nonrural (N=38)	512	16.4	2,313	74.1	247	7.9	47	1.5	3,119	99.9
Large										
2,500–4,999 (N=18)	609	25.3	1,461	60.8	300	12.5	35	1.5	2,405	100.1
5,000+ (N=26)	411	17.4	1,318	55.8	606	25.7	26	1.1	2,361	100
Large Total (N=44)	492	20.7	1,376	57.8	482	20.3	30	1.3	2,380	100.1

[1]Total revenues are calculated by adding operating revenues from local, state and federal sources to tuition and fees. Revenues from auxilary services or other sources are not included.

[2]Percentages may not total 100 due to rounding.

These revenue figures, while interesting, leave many questions unanswered. First of all, the variation in revenue source is more likely due to a state's governance pattern and funding policies than to differences in size or setting. The use of *mean* data, inherently sensitive to extreme values, may mask the true dispersion of revenue among institutions within the same category.

Table 17 contains data which more clearly depict the wide range of revenues available to community colleges of different sizes and settings. Although small colleges generally receive more operating revenue per student than do larger colleges, the range in revenue receipts is considerable; as much as $4,000 per student in very small rural colleges and over $6,500 among small, nonrural colleges. While the ranges are less pronounced, even some of the very large colleges are funded at more than twice the level of other large institutions.

Table 17

Dispersion of Total Revenue[1] Per FTE Student by Institutional Size and Setting

	Low	1st Quartile	Median	3rd Quartile	High
Small Rural					
1–999 (N=52)	$1,911	$2,425	$3,051	$3,787	$5,955
1,000–2,499 (N=108)	1,625	2,297	2,728	3,220	5,857
Total Small Rural (N=160)	1,625	2,323	2,875	3,336	5,955
Small Nonrural (N=38)	1,285	2,224	2,691	3,312	7,809
Large					
2,500–4,999 (N=18)	1,869	2,132	2,306	2,778	2,950
5,000+ (N=26)	1,473	2,046	2,316	2,677	3,488
Total Large (N=44)	1,473	2,114	2,306	2,700	3,489
All Colleges (N=242)	1,285	2,228	2,715	3,227	7,809

[1]Includes only operating revenues from student, local, state and federal sources.

Two other items warrant mention. The long-held contention of small rural colleges' leaders that they are relatively disadvantaged in attracting federal funds simply is not borne out, at least on a per-FTE student basis. Federal funding, amounting to less than 2 percent of operating revenues in all cases, is but a drop in the bucket to community colleges in this study, regardless of size or setting. But both on a proportion-of-revenues and per-FTE student basis, small rural colleges attract more federal dollars than do the larger institutions.

The argument could be made, of course, that although the per-FTE student funding is higher in small colleges (forty seven dollars in small rural colleges and thirty dollars in large colleges), the total *amount* of funding in small colleges is such that major impact on programs or services is difficult to achieve. In our judgment, that argument does not hold up because everyone views federal funds as supplemental—the icing on the cake—rather than support for core programs. Institutions who look to Washington for substantial general support have unrealistic expectations from the beginning.

Second, the complaint that state funding formulas and procedures do not recognize the high cost of doing business in small colleges is not supported. We found in all states substantial inverse relationships between size and revenue (see Tables 16 and 17). Moreover, comparing the states that formally recognize size in their funding formulas (TenHoeve, 1981) with states without such recognition illustrates no significant differences in the relative funding advantage of either group. In fact, we went one step further; we compared the states that TenHoeve and our respondent presidents agreed did recognize size with those that TenHoeve and our respondents agreed did not recognize size, and we found no significant differences in funding. Even without formally stated policies, states and localities have recognized the economy-of-scale problem and have funded small colleges (rural and nonrural) at substantially higher per-student levels than they have larger colleges.

One important point is that many small college presidents state they are underfunded and seem unaware of formal plans to recognize size in their state's funding formula. Within each of ten states presidents disagreed when asked if recognition of size was included in their state funding formulas or procedures. Respondents from five states included detailed descriptions of the differentials, while their peers from neighboring colleges instate responded that no recognition was made.

The total mean revenue data presented in Table 19 show clearly progressively higher revenues, on a per-FTEs basis, as institutional size decreases. Regardless of source of funds, larger colleges have fewer dollars to spend on each student than smaller colleges have. A more detailed financial analysis is presented in the following section.

Educational Costs and Comprehensiveness. Howard Bowen (1980) suggested that educational costs, at least in the short run, are determined by revenues. In other words, educational institutions spend what they get. No profit motive, no shareholders to return

dividends to, and, in most public institutions, no provisions whereby operating costs can be "laid by in store" for harder times are present. In this "revenue theory of costs" proposed by Bowen, expenditures approximate revenues, with the increasing revenues, ideally, diverted to expenditures which ostensibly result in improvements in educational quality, including more favorable student/teacher ratios, higher faculty salaries, more library holdings, and updated instructional equipment.

For his expenditure analysis Bowen (1981) used an expenditure variable which he called "educational cost" (p. 22). This measure referred to current expenditures of institutions, less outlays for organized research and public service, as well as a *prorated* share of overhead attributed to research and public service. He excluded expenditures for auxiliary services such as residence and dining halls, teaching hospitals and student unions.

We used a measure which we call "IEG/FTE" (instructional educational and general expenditures per full-time equivalent student). Expenditure analysis in the public two-year college was simplified by the exclusion of research, public service, and auxiliary enterprise funds for which Bowen had to control. Moreover, no adjustment is required for student level, since all credit students are classified as "lower-division" students. Although calculated somewhat differently, Bowen's "educational costs" and our "IEG" variable measure essentially the same thing.

The mean IEG/FTE expenditure figures, along with the range of these costs, are presented in Table 18. As was true with the revenue data from Table 16, educational costs per student increase as enrollments decrease. Average expenditures per student varied over one thousand dollars, between the $2,554 expended on students in the largest size category to $3,567 in rural colleges with enrollments under 1,000 students. Intra-group variations were even higher with a range of nearly $4,000 in the very small rural category, over $5,000 in the 1,000 to 2,499 enrollment group, and over $3,000 in the small nonrural colleges.

Table 18

Mean IEG[1] Expenditures per FTE Student
by Institutional Size and Setting (1980–1981)

Institutional Size & Setting	IEG/FTE Student Mean	Range
Small Rural		
1–999 (N=52)	$3,567	$2,055–5,951
1,000–2,499 (N=108)	3,106	1,592–6,823
Total Small Rural (N=160)	3,256	1,592–6,823
Small Nonrural[2] (N=34)	2,959[2]	1,320–4,469[2]
Large		
2,500–4,999 (N=18)	2,662	1,851-3,190
5,000+ (N=26)	2,554	1,584–3,846
Total Large (N=44)	2,598	1,584–3,846

[1]Instructional educational and general expenditures (IEG) equals total educational and general expenditures minus expenditures for research and public service.

[2]Four Alaskan community colleges with headcount enrollments under 1,000 and with IEG/FTEs ranging from $6,324 to $8,795 were deleted from the analysis at this point. Their inclusion resulted in skewed and misleading mean scores.

Merely inspecting the mean cost or expenditure figures leads one to anticipate the conclusion that the costs of providing educational experiences are higher in small institutions. When tests of statistical significance (t tests) were applied to these mean expenditure data, such initial impressions were supported. No significant differences between costs in small rural and small nonrural colleges were evident but the cost differences between small colleges, both rural and nonrural, and large colleges were significant ($p < .05$).

Cost and Comprehensiveness. As clear as the cost data are, they add little to what has long been known, or at least suspected, regarding the relationship of size to cost in educational institutions. The concept of "economy of scale" is familiar to even the casual student of higher education finance. A much more obscure relationship exists between cost and program diversity or, as we use in this study, cost and comprehensiveness. Several studies (Allen and Brinkman, 1983; Bowen, 1980; Carnegie Commission, 1972; McLaughlin, and others, 1980; and Mullen, 1981) give at least tentative support for the association of higher unit costs in institutions with diverse curricular offerings. However, most of these findings were of a serendipitous nature, incidental by-products of economy-of-scale studies.

We have attempted to link, conceptually, comprehensiveness with access and mission attainment in the community college. We have added this link to the already well-supported notion that economics of scale are difficult if not impossible to achieve in small community colleges. We have further demonstrated that curricular comprehensiveness, as we define and measure it, is far more achievable in large institutions than in small ones. What part does cost play in the relative program diversity that an institution can offer? Is comprehensiveness so expensive, as cautioned by Reynolds (1969), that only those colleges which are unusually well funded or so large that economics inherent in size provide cost savings can afford it? These are the questions we shall now attempt to answer.

To explore the relationship of cost to comprehensiveness we first performed a simple rank-order correlation between the comprehensiveness index and IEG/FTE. The results of these tests are displayed in Table 19. The correlation coefficient approached zero in both small rural colleges and large colleges, and the correlation between cost and comprehensiveness in small nonrural colleges was weak (–.181). None of these coefficients was significant at the .05 level of confidence.

Table 19

Spearman Rank Order Correlation Coefficients
Between IEG/FTE and the Comprehensiveness Index
(by Institutional Size and Setting)

Institutional Size & Setting	Correlation Coefficient	Significance Level
Small Rural (N=160)	-.001	NS[1]
Small Nonrural (N=38)	-.181	NS
Large (N=44)	.005	NS

[1]NS equals not significant

Association between instructional expenditures per student and program diversity appears to be small, at least as measured by a bivariate statistical procedure. In one last effort to explain the variation in comprehensiveness among small rural community colleges, we performed a stepwise multiple regression procedure to determine which combination of selected variables best predicted comprehensiveness. The strong positive relationship between size and comprehensiveness has been clearly demonstrated throughout this study. To keep size from overpowering the other predictor variables in the regression equation, a regression analysis was done in which five variables—the IEG/FTE and four source-of-revenue variables (proportion of total revenue received from tuition, local, state, and federal sources)—were allowed to enter into the prediction equation in their order of strength, that is, according to the proportion of the variance in comprehensiveness each explained. The source-of-revenue variables were selected for examination because of the claim that local funds and the autonomy which accompanies them enable colleges to be more responsive to their communities. Similarly, federal support is frequently viewed as necessary for small colleges to be able to develop and deliver expensive programs.

Those who wish to continue that argument will have to look elsewhere for support for their point of view. None of the cost or source-of-revenue variables, taken singly, accounted for as much as 4 percent of the variance in the comprehensiveness index. Even when considered as a group, the resulting R^2 was only .057.

By adding the size variable, headcount enrollment, to the five predictor variables just examined, the regression treatment results in a multiple R of +.474, accounting for 22 percent of the variation in comprehensiveness scores. Since size alone accounted for just over 17 percent of the explained variance, the addition of the remaining variables had little effect on the prediction equation.

Summary. When examined singly and in tandem, educational costs per student and several source-of-funds variables showed little relationship to comprehensiveness. Even when size was added, the predictive value of the equation was weak, at best. What, then, accounts for the wide unexplained variation in program diversity, even within the small rural college group? We address that question in the next section.

STRATEGIES THAT FOSTER COMPREHENSIVENESS

Even when controlling for size—the best predictor of comprehensiveness–wide variation in program diversity exists. Moreover, costs, generally thought to vary positively with program diversity, added little to the predictive value of an equation designed to explain the variance in comprehensiveness index scores among small rural community colleges. In fact, more than three-fourths of the variance remained unexplained when a regression analysis was performed using cost (IEG/FTE) and four source-of-revenue variables as predictors.

Where, then, does one turn for an explanation of the noted disparity in program comprehensiveness? Phillips (1980) introduced his compilation of innovative practices in small rural colleges by describing many of the problems we have identified earlier and concluding, "Small/rural colleges have had to find ways to meet these problems and for this reason have developed and utilized unusual and innovative techniques to a larger extent than their urban counterparts" (p. xvi). From our own observations and experiences, we anticipated that some variation in program diversity might be explained by innovative instructional methods, curricular designs, staffing patterns, or other purposeful arrangements, and we have written about such methods for "doing more with less" (Atwell, 1981). Our survey contained open-ended items designed to elicit information about such practices in place at colleges in our sample. We especially sought examples of strategies initiated by the colleges specifically to achieve greater comprehensiveness without substantial increase in costs.

We expected many of the respondents to give us "laundry lists" of activities ranging from the obvious, such as extensive use of part-time faculty, maximum use of individualized instruction, faculty teaching courses in multiple disciplines, and clustered curricula capitalizing on common courses, to less obvious practices such as mobile laboratories, jointly hired faculty, and cooperative education to deliver the majority of specialized courses in one or more programs. In fact, we expected a few of those colleges with high CI scores and low per-student costs to develop substantial lists of numerous special actions they had taken to achieve their high level of diversity. However, no college listed more than three or four practices they felt contributed to their relative comprehensiveness, and more than half of the respondents listed none. The responses were clearly insufficient to warrant the analysis among institutions we had planned.

Although detailed comparative analyses were not possible, respondents did identify a number of practices which seem to hold considerable promise as strategies for increasing comprehensiveness within limited budgets. The following sections contain descriptions of strategies identified in our survey and amplified through telephone follow-up calls to presidents at a number of the colleges sampled. We have also described strategies we observed in place at small rural colleges as well as innovative practices listed by Phillips (1980) that should permit increased comprehensiveness. Although we recognize the overlap between the categories, we organized the practices we chose to describe under strategies that are primarily related to (1) instruction and curricular design, (2) staffing, (3) collaboration, and (4) other. Though some of the practices will be familiar to all readers, others may be viewed as innovative and unusual.

Instructional and Curricular Strategies. The practice most often mentioned by survey respondents and one that appears frequently in Phillips' (1980) book was individualized instruction. Many of the colleges surveyed reported that they could not have continued a number of the courses they offered except through individualized instruction. The majority of those who did list individualized instruction described the use of competency-based modules available in open laboratories and shops where students could take various levels of the same subject, or in some cases, different subjects at the same time, under the supervision of one faculty member. Many of the colleges described collegewide learning laboratories where commercially packaged and locally produced instructional materials were available; students could pursue parts of some courses and some complete courses under the general supervision of one professional. Two

colleges noted that they had targeted their efforts in competency-based and individualized instruction on classes that were traditionally underenrolled. One respondent from a West Virginia college estimated that more than 35 percent of the college's credit instruction was offered through individualized instructional modes. That college, by the way, was the most comprehensive of the small rural colleges included in our sample.

Use of open laboratories, mentioned above as one location for individualized instruction, was listed by a number of colleges as a specific means for expanding their curriculum. One college offered multiple levels of art in a large studio where students could progress at their own rates. A number of colleges have developed open laboratory concepts in secretarial science, with the majority of the curriculum available on an individualized basis.

Use of radio, television, and newspapers to extend the curriculum to a wider base of students and allow greater diversity did not often appear in our survey responses, though one college reported success using cable TV to transmit credit courses throughout much of the college region. Others cited problem areas, such as lack of professional televideo equipment or access to cable networks in their rural regions. Phillips described an excellent example of the use of television, radio, and newspapers to extend credit offerings throughout the college region at Dodge City Community College in Kansas (1980, pp. 84–85).

At some of the colleges in our sample, programs are designed to use common core courses for a number of related curricula, with branching into specific program areas usually coming at the beginning of the second year. Frequently, certificates are offered at the end of the generic one-year program and diplomas or degrees at the end of two years. Examples included one-year certificate programs in general secretarial work, with second-year specializations in medical, legal, and executive secretarial areas and a one-year certificate in electronics with branching opportunities in communications electronics, industrial electricity, and industrial instrumentation. Other clustered or branching programs were suggested in law enforcement, health technologies, business, and drafting. In each case the college respondents felt that without common first-year curricula with fairly large classes, their college could not maintain all of the programs available at the second-year level.

Staffing Strategies. Common among responses to our survey were heavy uses of part-time faculty, faculty members teaching two or more disciplines, and teaching by administrators as means of maintaining or

enhancing comprehensiveness. Further research is needed, but we found no evidence that small rural community colleges use part-time faculty more heavily than do other colleges. In fact, some presidents have indicated a lack of available, qualified adjunct faculty as one of the handicaps they face. We are sure, that faculty and administrators at small colleges are asked to assume more diverse tasks, to "wear many hats," and that the faculty are more likely to teach in two or more disciplines and have three to six different preparations each term. Nearly every respondent to our question about practices to achieve comprehensiveness listed "multi-talented faculty," "teaching in more than one discipline," "administrators teaching," "teaching assisting with administration," and other similar responses.

One college described a program where industry lends personnel to teach special courses in management, science, mathematics, and engineering. It seems to us that joint hiring of faculty with other colleges, secondary schools, business, industry, government, or hospitals might provide an excellent means of getting the faculty necessary to teach that one section of calculus, physics, engineering, or management that is needed to round out a curriculum. In some parts of the country, business and industry are allowing their employees to work in such roles on a volunteer basis, while in other sections colleges purchase the individual's time.

Collaborative Strategies. Cooperation has been mandated in some states where regional programs are designed to allow maximum transfer from other colleges. For example, in Virginia, one two-year program in forestry was deemed sufficient to meet statewide employment needs, so only one college was permitted to develop the curriculum. The program was designed, however, to permit students to complete the first year at any community college in the state and transfer to the specialized program for the second year. In that state there are numerous other programs similarly designated as regional programs, thus limiting program proliferation and helping to insure adequate enrollments where those programs do exist.

In other instances cooperation grew from the interest of local college personnel looking for ways to provide programs they could not justify on their own. In one rural region of Virginia, three community colleges developed cooperative programs in nursing to allow students to take most of their coursework at their home institution. The colleges shared nursing faculty, shared specialized clinical facilities throughout the service regions of the three colleges, and provided the critical mass to make the program succeed without saturating the colleges' service regions with graduates. That program's success

resulted in cooperative programming in other allied health areas, including medical laboratory technology, inhalation therapy, and radiologic technology.

In the above case, the colleges were of similar size and type, but large and small colleges similarly cooperate. The large college serves as host, while the surrounding small colleges provide satellite programs so that much of the course work can be taken close to home. The specialized courses in the second year are offered two or three days a week at the host campus. In the first example, students earn their credit and degrees at their home college. In the large-and-small-college cooperative, most credits are earned at home but credit for specialized courses and the degrees are offered by the host college.

One college in Maryland has a number of similar cooperative programs with a regional hospital. Nursing students take considerable coursework at the college but complete the hospital diploma program that is subsequently transferrable into an area BSN (bachelor of science in nursing) program. In the radiologic technology program, all course credit and the degree are offered by the college even though facilities, equipment, and instructors are provided (at no cost to the college) by the hospital.

Mobile laboratories are used in Kentucky to make dental hygiene programs available in the rural regions of that state. The laboratories (there are two of them) remain on site for three years to allow two classes of 12 students each to complete the program. Then the labs are moved to another college site; the program coordinator and occasionally an instructor move with them. By rotating the programs the colleges avoid overproduction of graduates in any single region but provide training needed by the localities and sought by the students.

Other examples of collaboration in Kentucky were identified with nursing and medical laboratory technology similar to those described earlier. In one area a regional nursing program offers credit and degrees at the home college, but faculty and facilities are shared. In another area one small rural college without a nursing program has collaborated with another similar college which offers nursing to allow its students to take most courses at the home college but to transfer to the second college for specific nursing courses. Similar arrangements make medical laboratory technology training available at both institutions.

Other Strategies. Many respondents reported the use of off-campus sites as essential to their success. One small college reported 22 sites where credit instruction was offered. Instruction at off-campus sites

may do little to build class sizes on campus, but in many small colleges it may be essential to gain sufficient enrollments in certain curricula to justify their continuation or to maintain an instructional load for a needed faculty member.

Respondents described community theatres, orchestras, and choruses, where students and citizens join together to provide the performance base for credit instruction in the arts. Student enrollments alone would have been insufficient to build performing groups that could attract audiences. One college has a very successful dinner theatre program that brings community leaders to the college on a regular basis. Another college has assembled numerous ex-professional musicians to join students in building a "Big Band Sound" orchestra that has played at the governors' inaugural balls and at other prominent occasions throughout the state and region. A third college reported a chorus that regularly performs musicals and Handel's Messiah each Christmas.

Lack of public transportation has been cited as a major deterrent to small rural college success. A few colleges reported that transportation systems have aided them in building their enrollments. In a rural region of Florida, the county school systems allow community college students to ride regular bus routes to the area high schools, where they are met by a special bus to the college. The route is then reversed in the afternoon. The college pays a nominal amount for the service. In another state, a small rural college has obtained support from local county governments to purchase used school buses and to pay maintenance and fuel costs for the buses to run regular routes throughout the college's region. Drivers are provided by the college using college work-study resources.

In most states community colleges are commuter institutions only, but in a few states residence halls are available for students who have great distances to travel or who want to enroll in programs not available in their own districts. A few colleges have established small residence halls for students in very specialized curricula to help insure that sufficient numbers of students will be enrolled to maintain the program. In Arizona most of the small rural colleges have residence halls, and students there are permitted to enroll in a college outside their own district but pay only resident tuition to participate in a program not otherwise available to them.

Each reader has probably thought of numerous strategies not listed here. We have attempted only to describe a number of representative practices we think demonstrate how colleges can increase or maintain curricular comprehensiveness with little or no increase in costs. If there are additional programs needed because of

new jobs or student interest—if there is *good* reason to expand comprehensiveness—the means usually exist. They may not be without extensive hidden costs in program quality.

It is all well and good to suggest that small colleges should seek faculty members with preparation in more than one discipline, but will a faculty member with two master's degrees gain the same faculty rank and salary as one with a master's degree and an additional year of advanced graduate work in the same field? Faculty members in small colleges usually have many different preparations, but can we expect the same quality of instruction as we might from one who teaches multiple sections of the same courses? It is exciting to learn of the many examples of success found in individualized, self-paced instruction, but is self-paced instruction suitable for all students? If some programs can be completed only through extensive independent study, will they be unattainable for students who do not work well alone? Will mobile laboratories that rotate to other institutions after three years eliminate students who may require longer time to complete the program? Will extensive use of part-time faculty for specialized classes preclude out-of-class assistance for students who need additional instruction? These questions deal with just a small number of problems that may arise from efforts to cope with small enrollments.

Nearly all of the practices we have described or suggested have inherent dangers that, if care is not taken to avoid abuse, may outweigh the advantages of program diversity gained through their implementation. College leaders must evaluate carefully the benefits and costs of adopting these and other techniques to make certain their students are best served. In some cases access to certain programs may be so beneficial that relying on part-time faculty, traveling to other sites, or receiving considerable instruction by television or independent study become acceptable prices to pay. In other cases, however, one might determine that the nature of the material, abilities of the students, or other factors, would affect the quality of the program to the extent it should be not offered.

In all fairness we should add that not all innovative practices will create efficiencies, nor should they; small rural colleges reported numerous existing innovations that we did not report here because they were not viewed as aiding comprehensiveness within limited budgets. Second, we found very comprehensive small rural colleges with low enrollments and lower-than-average budgets with few identifiable practices one would call innovative or that were designed to enhance comprehensiveness and to compensate for economy-of-scale problems. There are other factors, yet unclear, that apparently

make a difference. Leadership by presidents, deans, faculty members, and other key personnel must be important elements of successes noted at many of the colleges in our sample. We have written about the exceptional leadership required to make small rural colleges succeed (Sullins, 1981) and we sense that visionary leadership does exist at many of the colleges we have identified.

PART 4: SUMMARY AND RECOMMENDATIONS

SUMMARY

The purpose of this study was to test, as systematically as possible, several of the commonly held beliefs about small rural community colleges. The literature is replete with statements regarding the unique nature of these institutions as well as lists of problems which, if not unique to small rural colleges, are at least exacerbated by the very nature of the colleges and the communities which they serve.

We began with the proposition that at least a modicum of curricular comprehensiveness was vital to mission attainment in the small or large community college, whether rural, suburban or urban. Our *a priori* beliefs on this topic were strengthened as we read and as we talked with leaders in small colleges. We recognize that comprehensiveness is a relative term. No magic point exists on a continuum above which an institution can be labeled comprehensive and below which one can be found lacking. Nonetheless, we firmly believe—and we uncovered considerable support for our stand—that every community college worthy of the name must make an effort to offer to the citizens of its service area as wide an array of program choices as possible, within the parameters of community need and quality assurance. Without the availability of reasonable curricular choice for students and prospective students, true access cannot be said to exist.

Curricular Comprehensiveness. To assess the degree of curricular comprehensiveness extant in small rural community colleges, we collected data on transfer and occupational-technical offerings from 160 public two-year colleges (1) that enrolled fewer than 2,500 headcount students, (2) that identified themselves as "rural" on an AACJC survey, and (3) that offered—and awarded in 1980–1981—associate degrees in both transfer programs and one or more occupational-technical fields. For comparative purposes we collected two similar data sets: one from 38 community colleges that met all the criteria above except that they were *not* located in a rural area, and the second from 44 community colleges that enrolled more than 2,500 headcount students.

To analyze the degree of program diversity in community colleges, we constructed an index of comprehensiveness (see Part 2 and Appendix A) designed to measure both breadth and depth of

curricular offerings in transfer programs and courses, and in certificate, diploma, and degree programs in occupational-technical fields.

The Transfer Component. With the notable exception of professional work in architecture, engineering, and agriculture, the vast majority of small rural colleges, even those with enrollments under 1,000, managed to offer transfer-oriented experiences in a fairly wide array of options. At least three-fourths of these colleges, for example, offered transfer work leading to acceptance at the junior level in business administration, teacher education, liberal arts, mathematics, natural sciences, and computer science.

The availability of transfer-oriented courses and course sequences was equally impressive in small rural colleges, with only foreign language, advanced mathematics beyond calculus, courses in philosophy or humanities, and performance courses in music offered in fewer than 80 percent of the colleges.

Comparisons of transfer program and course/sequence offerings revealed few differences, none statistically significant, between offerings in small rural and small nonrural colleges. Similarly, there were no significant differences in transfer comprehensiveness between very small (enrollments fewer than 1,000) and small (enrollments between 1,000 and 2,499) rural colleges.

As expected, large community colleges were able to offer more diverse transfer programs than their smaller counterparts. Comparisons between size categories of large community colleges, however, showed no significant differences; that is, once an institution reached a headcount enrollment of 2,500, transfer comprehensiveness did not appear to increase with increased enrollment.

The Occupational-Technical Component. Differences among institutional types in occupational-technical program diversity were much more pronounced. Comprehensiveness increased with size in every size category: very large colleges (5,000 or more) were more comprehensive than large (2,500 to 4,999) colleges which were, in turn, more comprehensive than small colleges, rural or nonrural. These differences applied not only to overall occupational-technical comprehensiveness but also to each of the career clusters except natural science technology, where program differences between small rural and small nonrural colleges were not significant.

The strong relationship of occupational-technical comprehensiveness and size prevailed even within the small rural category. Colleges with enrollments in excess of 1,000 were significantly more comprehensive than rural colleges with fewer than 1,000 students.

Like the transfer curriculum, the occupational-technical program exhibited no significant differences between small rural colleges, taken as a group, and small nonrural institutions.

Despite the unequivocal nature of the findings regarding size and comprehensiveness, there was a wide range of program diversity among institutions of similar size and setting and even considerable overlap among institutional categories. For example, the most comprehensive college in every size category was more comprehensive than the average college in the next larger grouping (see Table 15).

Funding. Despite protestations to the contrary, small rural community colleges receive special considerations from funding agencies. They receive more operating revenue per FTE student, charge lower tuition to students, and receive more money per student from state and federal sources. Moreover, this recognition of the increased cost of doing business in small colleges holds true even in states which claim their funding formulas do not take into account such considerations.

Since Bowen's (1980) cost-revenue theory of financing is especially applicable to public institutions, analyses of expenditure patterns in our sample of colleges closely resembled revenue patterns: in most cases, the smaller the institution, the higher the educational expenditure per FTE students (see Table 18).

Efforts to link costs to comprehensiveness, as some have suggested (Allen and Brinkman, 1983; Bowen, 1980; Carnegie Commission, 1972; McLaughlin, and others, 1980; and Mullen, 1981), have proved futile. Examined separately or in tandem with four source-of-revenue variables, financial variables showed little relationship to comprehensiveness.

Strategies. We were able to identify a number of instructional practices, curricular designs, cooperative ventures, and staffing plans that seem to allow colleges to offer certain programs or courses that were not otherwise possible without significant cost increases. We found many colleges that employed one or more of these practices, but we could not identify any college that employed a wide array of such strategies in an effort to be comprehensive. Nor did we find evidence that such practices were more prevalent in the colleges with the most comprehensive curricula. At a few of the small rural colleges with very high CI scores, we found in place few, if any, of the strategies we identified. Many innovative practices were underway at these colleges, but they lacked concerted efforts to employ practices for the specific purpose of enhancing comprehensiveness by compensating for low enrollments.

RECOMMENDATIONS

If the mark of good research is that it raises more questions than it answers, then placing a value on this study is a simple task. While we upheld some of the folklore about small rural community colleges and disproved some other, rarely were we able to substitute acceptable answers for the myths we dispelled. For example, even though small rural colleges receive substantially greater per-student funding than their larger counterparts we did not determine if these increased amounts were still inadequate to fund comprehensiveness or, perish the thought, were so generous as to invite waste or mismanagement.

Much of the wide variation in comprehensiveness remains unexplained, even when controlling for size, costs, and instructional strategies. Are these differences due entirely to differences in the communities in which the colleges are located?

There is still much to be learned about small rural community colleges. Despite the tentative nature of our findings—or in many cases, the lack of findings—we recommend the following considerations.

1. *As community college leaders and policymakers establish criteria for adding or retaining curricular programs, they should consider rural citizens' accessibility to programs unrelated to local employment needs and local employers' need for a few graduates from specialized programs each year.* Small rural colleges are often hampered by established productivity criteria for adding or maintaining programs that are relatively inefficient on a purely quantitative basis. The literature we reviewed contained substantive support for arguments that rural youth seek access to educational opportunities that may not be related to local employment needs. Local employers in rural areas frequently need a few specialized graduates each year from programs that may have to be operated at inefficiently low enrollments to avoid saturating the market. Citizens served by small rural community colleges should have access to a comprehensive curriculum that is equitable, within reason, to that available to citizens of other regions.

2. *States that currently do not formally recognize the higher costs associated with operating small rural colleges should develop clearly defined "economy-of-scale" criteria in their funding plans.* Already those states give *de facto* recognition in that their small rural colleges receive higher per-student funding than larger colleges in their states. The differential is equal to that in states formally recognizing economy-of-scale. All states and localities should study the costs associated with maintaining comprehensive curricula and equitable

access to programs to insure that the funding received is sufficient to provide quality as well as comprehensiveness. Citizens served by small rural colleges should not have to pay more for their programs. Their programs should not be of reduced quality resulting from excessive use of part-time faculty, faculty assigned to too many different course preparations in disciplines for which they are not trained, or other *abuses* of cost-saving measures implemented to compensate for inadequate funding.

3. *Small rural college leaders should look beyond additional funding as means for attaining or retaining comprehensive programs and should implement available practices to get maximum results from existing resources.* We have already stated that a potential for abuse exists in many cost-cutting practices, but colleges can achieve more effective use of their resources to allow increased comprehensiveness at little or no increase in costs. Small rural college administrators and faculty members should work to insure that their colleges implement the most effective and efficient modes of instruction, curricular designs, and staffing plans. Further, college leaders should explore possible collaborative arrangements with other colleges, schools, agencies, businesses, and industries, to enhance their program offerings.

4. *Small rural community college leaders should continue their efforts to make local, state, and national policymakers even more aware of the important role their colleges play in providing access to postsecondary education for a major segment of the nation's population and of the difficulties encountered in maintaining appropriate and needed programs.* The efforts of several small rural college presidents that led to the creation of AACJC's Commission on Small/Rural Colleges have resulted in considerable new interest in this group of institutions. To say that small rural colleges are ignored would be an overstatement, but they are hardly a focal point of research, of lobbying efforts, of the literature, or of national organizations. This important segment of higher education needs a reasoned, well-informed voice which can present the unique needs of these colleges and the clients they serve to decision makers at local, state, and federal levels.

5. *Community college leaders should continue to press for increased efforts in research on small rural institutions.* Study of economy-of-scale, the relationship of program diversity to access, the relationship of the nature of the community to the curriculum, and other topics will produce information needed to guide the institutions in the future. Much of this research should be action-type studies conducted by the colleges themselves and, where appropriate, coordi-

nated by AACJC or another agency. Other studies can best be conducted at the state level by coordinating agencies and still others by university researchers who have special interests in community colleges.

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APPENDIX A

CALCULATION OF THE TRANSFER AND OCCUPATIONAL-TECHNICAL INDICES

THE TRANSFER INDEX

The transfer index was calculated by assigning varying weights to complete university parallel sequences leading to transfer at the junior level in programs such as agriculture, business administration, engineering and teacher education. (See Table A.1 for a complete listing of the programs and program weights.) Then course sequences of one or more years were considered, followed by individual courses. (See Table A.2 for the course sequences, courses and their weights.)

Table A.1

Point Values Assigned to Transfer Programs

Program	Value[1]
Architecture	5
Engineering/Architecture	5
Agriculture	5
Business Administration	10
Teacher Education	5
Fine/Performing Arts	5
Liberal Arts	10
Mathematics	5
Natural or Physical Sciences	10
Computer Sciences	5

[1]Appropriate points were awarded if an institution responded "yes" to the question "Can students at your institution complete university parallel sequences leading to transfer acceptance at the *junior* level?" Business administration, liberal arts, and natural or physical science received a weight of 10 rather than 5 because of their generic nature and relative popularity.

Table A.2

Point Values Assigned to Transfer Courses in Course Sequences

Courses/Sequences	Value[1]
Two years in one or more foreign languages	3
One year each of three or more laboratory sciences	3
Two years of one or more laboratory sciences	1
One year of mathematics beyond calculus	1
One year of one or more behaviorial/social sciences (psychology, sociology, etc.)	3
One year each of two or more history or government sequences	3
One year each of two or more literature sequences	3
One year of philosophy/humanities	3
One year of physical education activity	3
At least one course in health, first aid or nutrition	3
Courses in art and/or music appreciation	1
Studio courses in art	1
Performance courses in vocal and/or instrumental music	1

A total of 96 points could be earned in the transfer component of the index if an institution offered every program, course and course sequence listed in Tables A.1 and A.2.

OCCUPATIONAL-TECHNICAL INDEX

The derivation of the occupational-technical index was considerably more complex and recognized not only program breadth across

[1]Appropriate points were awarded if an institution responded "yes" to the question "Does your institution offer the following courses?" Courses/sequences assigned a value of 3 were assumed to form the core of offerings in any transfer sequence.

occupational families or clusters but also breadth and depth within each cluster. As reported earlier, HEGIS data provide program completion information in 69 different occupational-technical curricula categorized into six occupational families or clusters. Moreover, it is possible for institutions to offer both an associate of applied sciences degree (AAS) and a lower-level formal award (diploma or certificate) in many of the 69 offerings. Table A.3 contains the titles of the six occupational clusters and the number of separate programs available in each cluster.

Table A.3

Occupational-Technical Cluster Designations with the Number of Programs in Each Cluster

Cluster Title	Number of Programs
Data Processing Technologies	5
Health Services and Paramedical Technologies	19
Mechanical and Engineering Technologies	17
Natural Science Technologies	8
Business and Commerce Technologies	12
Public Service Related Technologies	8

In calculating the o-t index, equal weight was given to degree programs and to certificate or diploma programs. The first program offered in each of the six occupational-technical clusters was weighted more heavily then the second curriculum within the same cluster with subsequent intra-cluster programs receiving still less weight. In effect then, institutions were considered more comprehensive if they offered one program in each of six clusters than if they offered six programs within the same family of occupations. Similarly, a diploma or certificate in a curriculum in which a degree was also established, or vice versa, was weighted less than a second curriculum, degree, or diploma/certificate in another curricular area within the same cluster. For example, an LPN (License in Practical Nursing) program in an institution which also offered an ADN (Associate Degree in Nursing)

program would receive less weight than a second program in the health services area, say dental hygiene.

The first program in a cluster was given a value of ten points, the second separate program within the same cluster was worth five points, the third, three points, and each subsequent new curriculum, one point. If an institution offered a diploma in a curriculum in which a degree had already been counted, or vice versa, it received one point for having a second level of curricular offering.

Once the point values were calculated for each of the six occupational clusters, each cluster value was adjusted to reflect the wide variation in program options (from 5 to 19 points) in each cluster.

Finally, the transfer index and the o-t index were weighted (transfer, 40 percent; o-t, 60 percent) and merged into the comprehensiveness index. The maximum score possible on the comprehensiveness index was 38. A more detailed description of the calculation process is available from the authors on request.

Information About The Clearinghouse

ERIC/JC (the ERIC Clearinghouse for Junior Colleges) is located at UCLA. It specializes in information about all aspects of two-year college education. Included in our collection are published and unpublished materials on public and private community and junior colleges, technical institutes, and two-year branch university campuses. These materials cover administration, faculty, students, instruction, curricula, support services, libraries, and community education.

Document Acquisitions. ERIC/JC acquires research reports, program descriptions, position papers, curriculum guides and other instructional materials, monographs, conference papers and proceedings, project reports, and other unpublished materials of value to those interested in two-year college education. Researchers, administrators, faculty, and support personnel can assist the clearinghouse by sending two copies of pertinent materials to Anita Colby, Documents Coordinator. No copyright is held by the Clearinghouse, so authors may reuse the materials for other purposes.

Document Availability. Documents accepted for the ERIC system will be announced in *Resources in Education,* a monthly abstract journal available in 4,000 libraries and information centers. The documents will be filmed on microfiche and housed in over 750 libraries across the country. Most documents may also be purchased from the ERIC Document Reproduction Service (EDRS) in microfiche or paper copies.

Journal Articles. The clearinghouse also annotates articles found in the core journals of the field of two-year college education for *Current Index to Journals in Education,* an annotated index to over 700 educational periodicals. Citations to both the journal articles in *Current Index to Journals in Education* and the ERIC documents in *Resources in Education* are computer searchable.

Clearinghouse Publications. The clearinghouse produces several series of publications which synthesize recent information about the two-year college field. We will be happy to send you copies of the most recent publications in the following series: *Junior College Resource Reviews,* Topical Paper monographs, and Fact Sheets. Also edited and coordinated at the clearinghouse are the Horizons monographic series published in conjunction with AACJC, and the *New Directions for Community Colleges,* a quarterly published by Jossey-Bass, publications. Ideas and outlines for these publications are welcome. Contact Gayle Byock, Associate Director.

Clearinghouse Services. Computer searches are conducted at the clearinghouse and may be tailored by topic, educational level, or a set period of years between 1966 and the present. A search is useful for a review of the literature, a research tool, conference program development, program or college review of comparison, development of new teaching and curriculum materials, planning, among other things. For search services, information about ERIC tools, and development of resource packets for conferences, contact Diane Zwemer, User Services Librarian.

Mailing List. Our quarterly Bulletin will keep you apprised of clearinghouse activities and publications. Write to us and receive it free. Our address is 8118 Math-Sciences Bldg. University of California, Los Angeles, CA. 90024. Phone: (213) 825-3931.

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